1   30043/JWE/A97

09/081926

EFFICIENT ALGORITHM FOR PCR TESTING
OF BLOOD SAMPLES

5

ABSTRACT OF THE DISCLOSURE

10   Systems, processes, and devices are provided which are useful for testing blood or plasma donations to detect those specific donations which are contaminated by a virus above a predetermined level. An apparatus and process is described which forms individual, separately sealed and connected sample containers from a flexible hollow tubing segment connected to a fluid donation container. The tubing segment is sealed at spaced-apart intervals along its length, with tubing segment portions in the intervals between the seals defining containers, each of which holds a portion of a plasma sample. The contents of the containers are formed into pools which are subsequently tested for virus contamination by a high-sensitivity test such as PCR. The pools are tested in accordance with an algorithm by which a sample from each donation is mapped to each element of an N-dimensional matrix or grid. Each element of the matrix is identified by a matrix identifier, X_{rcs}, where rcs defines the dimensional index. An aliquot is taken from each sample, and subpools are formed, each subpool comprising aliquots of samples in which one dimensional index is fixed. All of the subpools are tested in one PCR test cycle. The dimensional indicia of each positive subpool is evaluated mathematically in accordance with a reduction by the method of minors, thereby unambiguously identifying a unique element in the grid, thereby unambiguously identifying a uniquely positive blood or plasma donation.

JWE/mg

30

MLM 1936.1-*-12/23/96 1:52 pm

35